DOCUMENT RESUME

ED 065 572 TM 001 759

| | |
|---|---|
| TITLE | Battery Loader (textile) 8-19.01--Technical Report on Standardization of the General Aptitude Test Battery. |
| INSTITUTION | Manpower Administration (DOL), Washington, D.C. U.S. Training and Employment Service. |
| REPORT NO | S-248 |
| PUB DATE | Apr 63 |
| NOTE | 7p. |
| EDRS PRICE | MF-$0.65 HC-$3.29 |
| DESCRIPTORS | *Aptitude Tests; *Cutting Scores; Evaluation Criteria; Job Applicants; *Job Skills; Manufacturing; Norms; Occupational Guidance; *Personnel Evaluation; Test Reliability; Test Validity |
| IDENTIFIERS | Battery Loader; GATB; *General Aptitude Test Battery; Textile Industry |

ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is included. (AG)

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

ED 065572

# TECHNICAL REPORT

ON

# STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

## BATTERY LOADER (textile) 8-19.01

B-525 S-248

TI 001 259

U. S. Employment Service
in Cooperation with
Alabama State Employment Service

April 1963

GATB #2416

# STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

# FOR

# BATTERY LOADER (textile) 8-19.01

B-525

## Summary

The General Aptitude Test Battery, B-1002A, was administered during May 1960 to a final sample of 48 workers employed as Battery Loader 8-19.01 at Geneva Cotton Mill, Geneva, and Bama Cotton Mill, Enterprise, Alabama. The criterion consisted of combined supervisory ratings based on a descriptive rating scale. On the basis of mean scores, standard deviations, correlations with the criterion, job analysis data, and their combined selective efficiency, Aptitudes K - Motor Coordination, F- Finger Dexterity, and M-Manual Dexterity were selected for inclusion in the final test norms.

GATB Norms for Battery Loader (textile) 8-19.01, B-525.

| B-1001 | | | B-1002 | | |
|---|---|---|---|---|---|
| Aptitude | Tests | Minimum Acceptable Aptitude Score | Aptitude | Tests | Minimum Acceptable Aptitude Score |
| T | CB-1- G<br>CB-1- K | 75 | K | Part 8 | 80 |
| F | CB-1- O<br>CB-1- P | 75 | F | Part 11<br>Part 12 | 70 |
| M | CB-1- M<br>CB-1- N | 75 | M | Part 9<br>Part 10 | 75 |

## Effectiveness of Norms

The data in Table IV indicate that only 69 percent of the non-test-selected workers used for this study were good workers; if the workers had been test-selected with the above norms, 83 percent would have been good workers. 31 percent of the non-test-selected workers used for this study were poor workers; if the workers had been test-selected with the above norms, only 17 percent would have been poor workers.

TECHNICAL REPORT

I. Purpose

This study was conducted to determine the best combination of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery for the occupation of Battery Loader 8-19.01.

II. Sample

The GATB, B-1002A, was administered to a final sample of 3 men and 45 women employed as Battery Loaders 8-19.01; twenty-seven employees at Geneva Cotton Mill, Geneva, Alabama, were tested on May 17, 1960; twenty-one employees at Bama Cotton Mill, Enterprise, Alabama, were tested on May 19, 1960. The workers at both companies performed the same job duties. There were no minimum age or experience requirements for selection for employment at either cotton mill. Two to four weeks of training is required for a worker to become familiar with all phases of the work. All workers in this sample had completed the training period.

TABLE I

Means (M), Standard Deviations ($\sigma$), Ranges, and Pearson Product-Moment Correlations with the Criterion (r) for Age, Education, and Experience

| N = 48 | M | $\sigma$ | Range | r |
|---|---|---|---|---|
| Age (years) | 37.3 | 7.6 | 18-50 | -.033 |
| Education (years) | 8.1 | 2.3 | 4-12 | .250 |
| Experience (months) | 109.0 | 78.8 | 3-360 | .135 |

III. Job Description

Job Title: Battery Loadér (textile) 8-19.01

Job Summary: Tends a varying number of Draper Looms, replenishing the supply of filling yarn in the looms. Selects proper yarn, by color of chalk mark previously made on it, to refill the empty compartments of the battery or magazine. Unwinds a few feet of the yarn from the bobbin, pushes the bobbin into place in the magazine, draws the loose end of the yarn through notched guides on the magazine, and winds end of yarn around wheel at the end of the magazine. This leaves the bobbin ready to be inserted automatically into the loom shuttle when it is required.

Work Performed: Pushes buggy to end of alley and fills it with bobbins of yarn of proper size, according to color mark. Uses both hands to pick up bobbins from cart and place them in buggy.

Pushes or pulls buggy up and down alley between assigned looms. Reaches into buggy and picks up several full bobbins, holds them in left hand or places them under left arm. Unwinds two to three feet of yarn from bobbin, using right hand, and with left hand pushes the bobbin into place in slot in the magazine or battery. Using both hands, or in some cases right hand only, draws the loose end of yarn through the notched guides on the magazine, and winds end of yarn around wheel at the end of the magazine. (Some Battery Loaders lay loose end of yarn over wheel and wind yarn around wheel when three or four strands have accumulated.) Fills all empty slots in battery and moves quickly to next loom to repeat replenishing process.

## IV. Experimental Battery

All the tests of the GATB, B-1002A , were administered to the sample group.

## V. Criterion

The criterion consisted of ratings made by the first-line supervisors on USES Form SP-21, "Descriptive Rating Scale." Initial ratings were made during May 1960; reratings by the same supervisors on the same scale were made during June 1960. The rating scale consisted of nine items covering different aspects of job performance with five alternatives for each item. Weights of one through five indicating the degree of job proficiency attained were assigned to the alternatives. The total score on the scale is equal to the sum of the numbers checked for all nine items. A reliability coefficient of .90 was obtained for the criterion. Therefore, the final criterion consisted of the combined rating scale scores. These final criterion scores had a range of 51-84, with a mean of 68.04 and a standard deviation of 8.01.

## VI Qualitative and Quantitative Analyses

### A. Qualitative Analysis

On the basis of the job analysis data, the following aptitudes were rated "important" for success in this occupation:

Motor Coordination (K) - required for quickly inserting full bobbin of yarn into battery.

Finger Dexterity (F) - required for picking up bobbins, accurately placing bobbin into battery, and pressing it into proper position.

Manual Dexterity (M) - required for rapidly picking up several full bobbins at one time and moving them into position to be inserted into battery.

On the basis of the job analysis data, Aptitudes V-Verbal Aptitude, N-Numerical Aptitude, and Q-Clerical Perception were rated "irrelevant" for success in this occupation.

B. Quantitative Analysis:

TABLE II

Means (M), Standard Deviations (σ), and Pearson Product-Moment Correlations with the Criterion (r) for the Aptitudes of the GATB; N = 48

| Aptitudes | M | σ | r |
|---|---|---|---|
| G-Intelligence | 75.1 | 13.8 | .199 |
| V-Verbal Aptitude | 78.8 | 12.5 | .249 |
| N-Numerical Aptitude | 69.2 | 17.6 | .210 |
| S-Spatial Aptitude | 78.0 | 14.7 | .124 |
| P-Form Perception | 75.5 | 19.6 | .131 |
| Q-Clerical Perception | 79.3 | 11.0 | .205 |
| K-Motor Coordination | 84.2 | 16.7 | .205 |
| F-Finger Dexterity | 90.5 | 15.8 | .065 |
| M-Manual Dexterity | 100.3 | 17.9 | .208 |

C. Selection of Test Norms:

TABLE III

Summary of Qualitative and Quantitative Data

| Type of Evidence | Aptitudes | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | G | V | N | S | P | Q | K | F | M |
| Job Analysis Data | | | | | | | | | |
| Important | | | | | | | X | X | X |
| Irrelevant | | X | X | | | X | | | |
| Relatively High Mean | | | | | | | X | X | X |
| Relatively Low Sigma | X | X | | X | | X | | | |
| Significant Correlation with Criterion | | | | | | | | | |
| Aptitudes to be Considered for Trial Norms | | | | | | | K | F | M |

Trial norms consisting of various combinations of Aptitudes K, F and M with appropriate cutting scores were evaluated against the criterion by means of the Phi Coefficient technique. A comparison of the results showed that B-1002 norms consisting of K-80, F-70 and M-75 had the best selective efficiency.

VII. Validity of Norms (Concurrent)

The validity of the norms was determined by computing a Phi Coefficient between the test norms and the criterion and applying the Chi Square test. The criterion was dichotomized by placing 31 percent of the sample in the low criterion group because this percent was considered to be the unsatisfactory or marginal workers.

Table IV shows the relationship between test norms consisting of Aptitudes K, F and M with critical scores of 80, 70 and 75, respectively, and the dichotomized criterion for Battery Loader 8-19.01. Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers."

TABLE IV

Validity of Test Norms for Battery Loader 8-19.01
(K-80, F-70, M-75)

| N = 48 | Non-Qualifying Test Scores | Qualifying Test Scores | Total |
|---|---|---|---|
| Good Workers | 8 | 25 | 33 |
| Poor Workers | 10 | 5 | 15 |
| Total | 18 | 30 | 48 |

Phi Coefficient = .41
$\chi^2$ = 8.016
P/2 < .005

The data in the above table indicate a significant relationship between the test norms and the criterion for the sample.

VIII. Conclusions

On the basis of the results of this study, Aptitudes K, F and M with minimum scores of 80, 70 and 75, respectively, have been established as B-1002 norms for Battery Loader 8-19.01. The equivalent B-1001 norms consist of T-75, F-75 and M-75.

IX. Determination of Occupational Aptitude Pattern

The data for this study met the requirements for incorporating the occupation studied into OAP-35 which is shown in Section II of the Guide to the Use of the General Aptitude Test Battery, January 1962.